



WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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Vegetable Crops

Vegetable Crop Insects - Joanne Whalen, Extension IPM Specialist; jwhalen@udel.edu

Melons

Continue to scout all melons for aphids, cucumber beetles, and spider mites. *Be sure to read all labels carefully for rates and restrictions since some are restricted to only one application as well as ground application only.*

Peppers

As soon as the first flowers can be found, be sure to consider a corn borer treatment. Depending on local corn borer trap catches, sprays should be applied on a 7-10 day schedule once pepper fruit is $\frac{1}{4}$ - $\frac{1}{2}$ inch in diameter. Be sure to check local moth catches in your area by calling the Crop Pest Hotline (instate: 1-800 345-7544; out of state: 302 - 831-8851) or visit our website at <http://agdev.anr.udel.edu/trap/trap.php>. At this time, you will also need to consider a treatment for pepper maggot.

Potatoes

Continue to scout fields for Colorado potato beetle, leafhoppers, and aphids. We have seen an increase in leafhopper populations and low levels of aphids have also been found. Controls will be needed for green peach aphids if you find 2 aphids per leaf during bloom and 4 aphids per leaf post bloom. This threshold increases to 10 per leaf at 2 weeks from vine death/kill. If

melon aphids are found, the threshold should be reduced by half.

Snap Beans

Continue to sample all seedling stage fields for leafhopper and thrips activity. As a general guideline, once corn borer catches reach 2 per night, fresh market and processing snap beans in the bud to pin stages should be sprayed for corn borer. Sprays will be needed at the bud and pin stages on processing beans. Additional sprays may be needed after the pin spray on processing beans. Since trap catches can change quickly, be sure to check our website for the most recent trap catches and information on how to use this information to make a treatment decision in processing snap beans after bloom

After the pin spray on processing beans, the spray schedule will be determined by a combination of both moth catches and field scouting.

<http://agdev.anr.udel.edu/trap/trap.php>

<http://extension.udel.edu/ag/insect-management/insect-trapping-program/ecb-and-cew-moth-catch-thresholds-for-processing-snap-beans/>

Sweet Corn

Continue to sample all fields from the whorl through pre-tassel stage for corn borers and corn earworms. Both species can be found feeding in whorls and tassels of sweet corn. A treatment should be applied if 15% of the plants are infested with larvae. The first silk sprays will be

needed for corn earworm as soon as ear shanks are visible. Be sure to check both blacklight and pheromone trap catches since the spray schedules can quickly change. Trap catches are generally updated on Tuesday and Friday mornings. You can check our website (<http://agdev.anr.udel.edu/trap/trap.php> and <http://extension.udel.edu/ag/insect-management/insect-trapping-program/action-thresholds-for-silk-stage-sweet-corn/>) or you can call the Crop Pest Hotline (in state: 1-800-345-7544; out of state: 302-831-8851) for recent trap catches. You will also need to start scouting for fall armyworm larvae in whorl stage sweet corn. A treatment should be considered when 12-15% of the plants are infested. Since fall armyworm feeds deep in the whorls, sprays should be directed into the whorls and multiple applications are often needed to achieve control.

Storm Damaged Vegetables - Wind and Hail

- *Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu*

Several areas throughout Delmarva have been hit with violent storms producing heavy winds and/or hail. Damage to vegetable crops by severe wind and hail includes leaf defoliation, leaf tearing and shredding, stem breakage, stem bruising and wounding, loss of flowers and small fruit, and fruit bruising and wounding.

Effects of storm damage on vegetable crops and recovery of crops will depend on a number of factors including the type of vegetable, stage of growth, weather conditions immediately after storms, and prevalence of disease organisms. Continued hot, wet conditions after storm events pose the most risk by increasing disease incidence, particularly bacterial diseases.

Defoliation reduces leaf area and plants will need to grow new leaves from buds (for vegetables such as vine crops where this is possible). It will take several weeks to replace the leaf area lost. This will cause delays in maturity. If crops are more advanced, loss of leaf area can reduce fruit or storage organ quality (reduced sugars). Fruit or storage organ size may or may not be affected. Leaf area

recovery (growing new leaves) will be aided by additional nitrogen applications after the storm event.

In crops such as sweet corn that cannot grow new leaves, research has shown that hail damage will reduce marketable ears and overall tonnage if leaf damage occurs in vegetative stages or at silking. Leaf loss near harvest will have minimal effects.

Fruit bruising or wounding often causes the most severe losses in crops such as tomatoes. Fruits may be rendered unmarketable or of reduced grade. Wounds can also increase the incidence of some fruit diseases and storage rots. In particular, bacterial rots that normally are minimal may be increased in damaged fruits. In plants such as tomatoes, it is advised to remove damaged fruits from plants. These fruits are likely to be unmarketable and will just be a drain on food resources produced by the plant. By removing damaged fruits, remaining uninjured fruits will have access to more photosynthates being produced by the plant.

Stem breakage or injury can lead to major losses in some fruiting crops such as peppers by loss of fruiting area as well as increased sunburn as plants are opened up. Many vining crops will recover significantly from stem breakage by producing new branches, although production will be delayed.

Losses of flowers or small fruit may limit yield potential and delay crop harvest in many vegetable crops. Beans that are flowering are particularly susceptible and flower loss due to storms may lead to split sets.

Damaged plant tissue also can affect healthy surrounding tissue. As cell contents leak, enzymes, oxidative compounds, and other reactive chemicals are released that can injure surrounding cells.

Age and stage of development of plants will also be a factor in the overall impact of storm damage. A good example is with bean plants. In the case of hail, the bean plant is considered dead if it is in the cotyledon stage and is cut off below the cotyledons, or if the cotyledon is damaged by hail to such a degree that they have

no green leaf tissue or re-growth. The reason is that nutrients and food reserves in the cotyledons supply the needs of the young plant during emergence and for about seven to 10 days after emergence, or until there is one fully-developed trifoliolate leaf. Cotyledons are the first photosynthetic organs of the bean seedling and are also major contributors for seedling growth. Unlike corn, whose growing point is below ground until it reaches V5-V6, the growing point for beans is between the cotyledons and moves above the soil surface at emergence. This makes beans particularly susceptible to damage from hail, or anything that cuts the plant off below the cotyledons early in its life. Stand reductions are likely to follow hailstorms. If the first trifoliolate leaf is formed, photosynthesis by the developing leaves is adequate for the plant to sustain itself.

Of immediate concern after storms will be bacterial diseases on susceptible crops. Bacterial diseases have been shown to be more severe after storm damage as they can readily enter through wounds. Including copper products in spray programs after storm injury is recommended to limit bacterial diseases. In North Carolina research, peppers were shown to have increased bacterial spot after hail. Use of copper fungicides with maneb limited the effect of bacterial spot in these hail damaged peppers.

There has been some recommendation to use peroxide based fungicide/bactericide products after storm events. These products kill what they contact and have no residual. There may be some reduction in the numbers of disease organisms on plant surfaces; however, there is little research to show major benefits after storm damage.

General recommendations for storm damaged vegetables are to first evaluate the extent of the damage. According to the stage of the crop and extent of damage, determine if the crop can be salvaged. Crop insurance adjusters are trained to evaluate storm damage in many crops and should be contacted immediately for insured vegetable crops. For crops that will be salvaged or kept, consider applying additional nitrogen to encourage new growth where appropriate. Apply fungicides and include copper compounds where bacterial diseases are of concern.



Hail damage to cabbage

Low Calcium in Tissue Tests - Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu

Consultants are reporting that tissue tests of vegetable crops such as watermelons have lower than normal levels of calcium. Fields have been well limed. Calcium moves in the transpirational water flow in plants. In cloudy, wet weather, transpiration is reduced and calcium uptake is low. As weather returns to sunnier conditions, calcium uptake will improve. In vegetables sensitive to calcium deficiencies, foliar applications of calcium may be advised where tissue tests are low and plants are still in early fruit set stages.

Edema on Cole Crop Leaves - Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu

With the wet, cloudy weather we are seeing some edema on cole crops such as cabbage.

Edema is water blistering on cole crop leaves. The most common cause of edema is the presence of abundant, warm soil water and a cool, moist atmosphere. Under these conditions the roots absorb water at a rate faster than is lost through transpiration. Excess water accumulates in the leaf, some parenchyma cells enlarge and block the stomatal openings through

which water vapor is normally released from the plant; thereby contributing to further water retention in the leaf. If this condition persists, the enlarged cells divide, differentiate a cork cambium, and develop elongate cork cells externally to form a periderm. The rupture of the epidermis by the enlarged inner cells and the periderm account for the raised, crusty appearance of older edema spots.



Edema on cabbage leaf.

Photo by Gerald Holmes, Valent USA Corporation, Bugwood.org

Late Blight Confirmed on Tomatoes in Maryland and on the Eastern Shore of Virginia - Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; keverts@umd.edu

Late blight has been confirmed on tomatoes in Montgomery County, MD. This is the first positive late blight in Maryland this year. We have sent the sample for strain identification, and do not have that information, yet. Late blight was also confirmed on tomatoes on June 20 on the Eastern Shore of VA.

Delaware growers should continue preventative applications of chlorothalonil, Gavel or mancozeb. Scout the potato and tomato crops aggressively and contact Extension personnel for confirmation of suspect late blight.

Tomato Early Blight - Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; keverts@umd.edu

Early blight is one of the most common tomato diseases in the U.S. It occurs yearly in our region, but is most severe in periods of moderate temperatures and high leaf wetness. Early blight lesions may form on leaves, stems or fruit, and the lower (older) leaves are affected first. The lesions on leaves are dark with distinct concentric rings. They may be small, but can range up to ½ inch or more in diameter. Infected leaves may turn chlorotic. Early blight has become problematic this year because of our cool weather and high humidity. Many fungicides are available to manage early blight. Alternate a broad spectrum fungicide such as chlorothalonil, mancozeb, or Gavel with a more targeted material. Targeted fungicides include Cabrio, Endura, Flint, Fontelis, Priaxor, Quadris, Quadris Top, Revus Top, and Tanos. Remember to always alternate materials in different FRAC codes. Organic growers may find some benefit from use of OMRI approved copper products, or Sonata. All growers should maintain optimum, but not excessive nutrient levels to help the plants tolerate disease.



Early Blight on tomato foliage.

Potato Disease Advisory #8 - June 21, 2013 - Phillip Sylvester, Kent Co., Ag Agent;
phillip@udel.edu

Location: Art and Keith Wicks Farm, Rt 9, Leipsic, Kent County
Greenrow: May 5

Date	DSV	Total DSV	Accumulated P-Days	Spray Interval Recommendation
5/15 - 5/20	11	32		5-days
5/20 - 5/23	2	34		5-days
5/23 - 5/27	5	39		5-days
5/27 - 5/30	0	39		10-days
5/30 - 6/6	2	41	251	10-days
6/6 - 6/7	10	51	261	5-days
6/7 - 6/9	10	61	280	5-days
6/9 - 6-13	4	65	314	7-days
6/16 - 6/20	13	78	377	7-days

Late Blight

The threshold of 18 DSVs has been exceeded. Seventy-eight (78) DSVs have accumulated so far for any potatoes that established green row (approximately 50% emergence) prior to and since May 5. Favorable conditions have maintained the spray interval recommendation at seven (7) days. Late blight was confirmed on tomato in Montgomery County, Maryland and the eastern shore of Virginia. The website USABlight tracks tomato and potato late blight across the nation and can be found here:

<http://usablight.org/> Continue to scout your fields regularly for symptoms, especially since late blight has been found in neighboring states. Any suspicious samples can be sent to the UD Plant Diagnostic Lab or dropped off at your local Extension office. See the 2013 Commercial Vegetable Production Recommendations-Delaware: <http://extension.udel.edu/ag/files/2012/03/Potatoes.pdf>

Early Blight

We are using the predictive model WISDOM to determine the first fungicide application for prevention of early blight. The model predicts the first seasonal rise in the number of spores of the early blight fungus based on the accumulation of 300 physiological days (a type of degree-day unit, referred to as P-days) from green row. We have now exceeded 300 P-days as of Thursday, June 13. Airborne Early blight inoculum should rise 5-10 days after accumulating 300 P-days. A fungicide for early blight control is recommended. Commercial fungicide recommendations can be found in the 2013 Delaware Commercial Vegetable Recommendations Guide at <http://extension.udel.edu/ag/files/2012/03/Potatoes.pdf>

Bacterial Leaf Spot of Pepper - Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; keverts@umd.edu

Bacterial leaf spot (BLS) is a common and widespread disease of peppers in Maryland and Delaware. The bacterial pathogen that causes BLS is *Xanthomonas campestris* pv. *vesicatoria*. The disease may be seed borne or may become established on the crop after overwintering on Solanaceous weeds or volunteer plant hosts in the field. Tomatoes also are a host of this

disease. BLS spreads by splashing rain, irrigation, or mechanically on machinery or the hands of field workers, etc.

Symptoms of BLS on pepper are small irregular spots that often have a yellow halo or border. As the disease progresses, infected leaves turn yellow and drop off the plant resulting in extensive defoliation. Disease progress in the crop is favored by high moisture and high nighttime temperatures (optimum is about 75°F).

Several tactics should be employed to reduce disease. Host resistance is available in several cultivars. Plant cultivars with resistance or tolerance to races 1, 2 and 3, which are the most common races in the Mid-Atlantic. Clean seed is important - be sure seed is treated or use hot water seed treatment. Use only clean transplants, practice crop rotation, and do not plant peppers after tomatoes.

During transplant production, apply a streptomycin spray (for example, Agri-Mycin 17 or Agri-Strep) every 4 to 5 days. Maintain good fertility in the field to help plants tolerate disease. Spread of disease can be minimized with fixed copper applications or, alternatively, a Section 2ee is available for use of Quintec for Maryland and Delaware.

Finally, the following practices will help reduce carryover of BLS to future years: control solanaceous weeds, disk the field immediately after final harvest, and do not save seed from BLS infected crops.



Bacterial leaf spot (*Xanthomonas vesicatoria*) on sweet pepper
Gerald Holmes, Valent USA Corporation,
Bugwood.org

Bean Diseases - Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; keverts@umd.edu

Pythium Blight (Cottony Leak)

Pythium blight has been a problem on the Delmarva during periods of rainy weather and cool temperatures. The disease causes damage on several plant species, including beans. The presence of Pythium blight is obvious by the

profuse mycelia on infected fruit or stems. To reduce the damage from Pythium blight, improve air movement in and around the plants. Also, applications of Prophyte, K-Phite, Phostrol or Rampart have been effective in recent trials. A Section 24c label is available in Maryland and Delaware for use of Ridomil Gold Copper.

White Mold

We are at risk of white mold on green beans that are near or at flowering. The spray guidelines are that if the soil has remained wet for 6 to 10 days in your field and the bean crop is at 10 to 20% bloom, a fungicide should be applied. A second spray should be made 7-10 days after the first spray if the soil remains wet and blossoms are still present. Check labels for details on fungicide timing. The following are effective on white mold: Endura, iprodione, Omega thiophanate-methyl (Topsin-M), Switch, or Switch plus thiophanate methyl].

Remember that there is a very effective biological alternative to fungicide sprays. Contans is an outstanding alternative for organic and conventional growers alike. Contans is a formulation of the fungus *Coniothyrium minitans*, which parasitizes the survival structures of the pathogen *Sclerotinia sclerotiorum*. In trials throughout the U.S. Contans has worked well at reducing white mold severity. The challenge with using Contans is that it should be applied two months before the disease develops. Contans is OMRI listed from SipCam Advan, LLC. Because the product is living, it must be handled carefully prior to use.



Signs of *Sclerotinia sclerotiorum* (apothecia and sclerotia) on the soil surface.

**New Invasive Pest Reported in Maryland:
The European Pepper Moth** - Jerry Brust,
*IPM Vegetable Specialist, University of
Maryland; jbrust@umd.edu*

Stanton Gill has identified a new invasive pest of ornamentals and vegetables in Maryland: the European pepper moth, *Duponchelia fovealis*. The European pepper moth was found on petunia and geraniums from a wholesale greenhouse operation in Ann Arundel County in the last 10 days. The moth has spread around the U.S. and Canada (but only in greenhouses) since first being reported in 2004. The Government considered putting it under quarantine, but it spread so rapidly the idea was abandoned. It is not known yet if this pest has or will become established in the landscape, or is just found in the nursery and containerized vegetable trade. Based on the climate of its native habitat (Southern Mediterranean), this pest has a chance of becoming established in states along the west coast and the southeastern U.S. How far north the pest could move up the southeastern U.S. coastline is not known at this time.



This caterpillar feeds on a wide range of plants including ornamentals but also on several vegetables including tomato, pepper, squash and strawberries. The larvae feed on roots, leaves, flowers, buds and fruit. On leaves, this feeding damage appears as rounded or crescent-shaped holes on the outside of the leaves, but eventually the whole leaf is eaten. Usually the leaves that are attacked are at the base of the plant. Late instar larvae also can burrow into the plant stem (pepper, tomato, squash). I do not think this insect will become established in our area, but it may be a problem for some vegetable growers during the summer when it escapes from a greenhouse operation. If you see any odd leaf feeding or stem boring and the

larva looks something like the picture above give me a call at 301-627-8440 or jbrust@umd.edu.

**High Tunnel Tomatoes With Mite
Infestations** - Jerry Brust, *IPM Vegetable
Specialist, University of Maryland;*
jbrust@umd.edu

Last week I saw several high tunnel tomatoes with moderate to severe two-spotted spider mite (TSSM) *Tetranychus urticae* infestations (Fig. 1). These pests vary in color from white to yellow to red. Mites feed by sucking sap from the plant causing small white stippling marks on the top surface of the leaf (Fig. 2). This damage may look like other problems early on and because the mites are difficult to see on the underside of the leaf at this stage of damage their build-up can go unnoticed. The feeding damage then progresses to yellowing, wilting, browning, and eventual death of the leaves or whole plant. They occur in the highest numbers on the undersides of leaves, but when their populations get very high they can move to the top-side of a leaf or onto tomato fruit. In most of the HTs there were only 1 or 2 cultivars (out of 4-7 cultivars) that the mites were found on in heavy numbers. Growers need to be sure to check all the different varieties of tomatoes they are growing for mite infestations.

The warm, dry conditions in a high tunnel favor rapid mite development and reproduction, which enables them to complete a generation in as little as 5 to 7 days. Heavily infested leaves may be covered with very fine, irregular webs in which mites and eggs can be found (Fig. 3). Once the spider mites begin to make these webs they are even more difficult to control. This is because the mites hide under the protective layer of webbing making it that much more difficult to get spray coverage to the underside of the tomato leaf. For a heavy infestation, one miticide application usually will have to be followed by another about 7-10 days later to be sure all the adults, immatures and eggs are controlled. Check the Commercial Vegetable Production Recommendations Guide for miticides.



Figure 1. High tunnel tomatoes with a severe two-spotted spider mite infestation



Figure 2. Early TSSM feeding causes white stippling (specks) on tomato leaf



Figure 3. TSSM webbing on tomato leaflet. Dark specks are TSSM

Fruit Crops

Brown Marmorated Stink Bug Update -
Joanne Whalen, Extension IPM Specialist;
jwhalen@udel.edu

Although we do not have a fruit scouting program, we do have a few pheromone traps out near peach and apple orchards in the state and we have found a few adults in traps. Reports from neighboring states indicate that brown marmorated stinkbug adults, egg masses and early stage nymphs can be found in apples and peaches. In general, they feel that populations are still generally low but at higher levels than seen last year at this time. For more information on management in fruit, you will want to consider subscribing to Rutgers Plant Pest Advisory <http://plant-pest-advisory.rutgers.edu/>.

SWD Found in Cherries on the Eastern

Shore of Maryland - *Gordon Johnson,*
Extension Vegetable & Fruit Specialist;
gcjohn@udel.edu

There has been another report of spotted wing drosophila (SWD) in cherries, this time from an orchard in Caroline County, Maryland. We have a number of berry crops and soft fruits currently ripening (blueberries, raspberries, blackberries, early peaches) that may be at risk. Refer to the article by Jerry Brust for control measures:

<http://extension.udel.edu/weeklycropupdate/?p=5727>

Strawberry Renovation - *Gordon Johnson,*

Extension Vegetable & Fruit Specialist;
gcjohn@udel.edu

Matted Row Systems

In matted row strawberries, the goals in renovation are to reduce plant numbers by narrowing the rows, remove old foliage (reduces diseases), control weeds, reduce insect and mite pests, and promote new runner development (production of daughter plants). After renovation, regular irrigation and weed control are essential. High yields next year depend on having large, healthy, vigorous plants when fruit buds are initiated in late summer.

With matted rows, renovation starts with an application of 2,4-D amine herbicide (Formula 40) after the last harvest. If grasses are a problem a sequential application of sethoxydim (Poast) or clethodim (Select) may be necessary (do not tank mix with the 2, 4-D). After the last herbicide application, wait 3-5 days and then mow off the strawberries to just above the crown (do not damage the crown). Apply nitrogen fertilizer (25-60 lbs N/acre) at this time. Using a split N application half at renovation and half 4 weeks later is preferable. If other nutrients were low or deficient (as indicated by tissue tests prior to fruiting) then apply at this time. Subsoil fields with compaction from equipment or heavy foot traffic between the rows (U-pick plantings for example).

Next, narrow the rows with a cultivator, coulters/discs, a rotary tiller/multivator or other devices to 12-18 inches at the base. Matted row strawberries are edge bearers and benefit greatly from this narrowing. Strawberries produce new roots higher on crowns each year so try to throw about 1 inch of soil over the row (without covering the crowns). This will also help new daughter plants root (runners produced from mother plants).

After narrowing the rows apply preemergence residual herbicides. Apply 2-4 ounces of terbacil (Sinbar). This is one half the annual rate. Sinbar can injure some varieties and attention should be paid so as not to have overlaps. If Sinbar is not used, napropamide (Devrinol) or DCPA (Dacthal) may be applied at this time. These materials require adequate rainfall or overhead irrigation for activation. Devrinol and Dacthal benefit from being lightly incorporated (possible in row middles). During the summer, cultivate between rows to remove weeds and to sweep runners into the row. From late summer on, cut off any additional runners during cultivation (discs or coulters work best).

Weeds in the rows must be controlled throughout the summer. Sethoxydim (Poast) or clethodim (Select) may be sprayed over the top to control grass weeds. Clopyralid 0.12-0.25 lb (Stinger 0.33-0.67 pt/A) has a 24c label for use in MD, NJ, VA, and PA for over the top control of some broadleaf weeds. Hand hoeing will be necessary for removal of remaining weeds.

Irrigate strawberries so that they receive 1.5 inches of water (combined rainfall and irrigation) each week during the summer. Irrigation during late July and August are very critical to produce large plants as flower buds will be initiated starting in August. Continue irrigation through the fall until dormancy (at reduced rates). Strawberries may benefit from low amounts of additional nitrogen fertilizer (25 lbs of N/acre) later in summer depending on the vigor.

Plasticulture Systems

With the high cost of establishing strawberries planted on plastic mulch, many growers choose to carry them over for another year. First, evaluate the disease pressure on the planting. If

anthracnose was a major problem, you should not carry the planting over. If disease pressure was low, then renovation can proceed.

Goals in renovating plasticulture strawberries are to remove old foliage, remove any runners formed, remove diseased plant material from the field, control weeds, reduce insect and mite pests, and reduce crown size of very large plants.

Mow the strawberries as close to the crowns as possible without damaging them. Remove any diseased plant material from the field. Plants with more than 5 branch crowns will benefit from thinning. Using an asparagus knife, remove one half of the crown. Apply weed control measures between plastic beds (herbicides, cultivation, or combination) being careful not to apply herbicides over the plastic beds. Irrigate strawberries so that they receive 1.5 inches of water (combined rainfall and irrigation) each week during the summer. Fertigate with 40 to 60 pounds of nitrogen per acre in late August and add any additional nutrients as suggested by tissue tests. Continue irrigation as needed throughout the fall.

The key for carryover strawberries on plastic is not to have too many crowns going into the fall. Excessive crown numbers will reduce berry size greatly. Carry over beds should not be row covered until winter to avoid excessive growth and may not need row covers in mild winters until the frost protection period in March and April during flowering.

Agronomic Crops

Agronomic Crop Insects - Joanne Whalen, *Extension IPM Specialist*; jwhalen@udel.edu

Alfalfa

Continue to sample for potato leafhoppers on a weekly basis. We are starting to see a significant increase in populations. Once plants are yellow, yield loss has already occurred. The treatment thresholds are 20 per 100 sweeps on alfalfa 3 inches or less in height, 50 per 100 sweeps in 4-6 inch tall alfalfa and 100 per 100 sweeps in 7-11 inch tall alfalfa.

Field Corn

Over the past couple of weeks, we have observed the movement of cereal leaf beetle adults from adjacent small grains into corn fields. Although they are generally found on field edges, there have been recent reports of field wide infestations. Although we do not have any firm thresholds for this insect on corn, as a general guideline controls may be needed on corn for adult feeding damage if you find an average of 10 beetles per plant and 50% of the plants exhibit feeding damage. In the Midwest, it has been reported that the adult beetle is a vector of maize chlorotic mottle virus (MCMV) that causes corn lethal necrosis disease. Thresholds would be much lower if this disease is an issue. We still have not found this virus in Delaware; however, be sure to let us know if you find potential problems.

Soybeans

Although insect activity remains generally light on early planted soybeans, you should continue to sample fields on a weekly basis for bean leaf beetles, potato leafhoppers, grasshoppers, green cloverworm and spider mites. As barley and wheat are harvested and soybeans are planted, these fields will be susceptible to attack and grasshopper feeding can often cause stand loss. The following link provides a guideline for decision making on the above insect pests: <http://extension.udel.edu/ag/2012/06/05/ipm-soybean-insect-thresholds/>

Denitrification and Corn Fertilizer Programs - Richard Taylor, *Extension Agronomist*; rtaylor@udel.edu

As a follow-up article to my [article last week](#), I thought I should review what I'm seeing a lot of in northern Delaware and southern New Jersey.

When you look at many of the fields of corn in the northern part of Delaware and southern New Jersey, the impact of denitrification is readily visible (Photos 1-6). Many fields are showing typical N chlorosis symptoms that indicate that most, if not all, of the soil available nitrate-N has been lost as N₂, NO or N₂O gas. In some cases, the economic loss of N was minimal as the growers applied only small amounts of N as

starter. However in other cases the amount of applied N was much greater and done to allow greater flexibility in the timing of sidedress N. In other cases, not only was commercial fertilizer as urea ammonium nitrate solution (UAN) applied but past efforts at building soil organic

matter had been expected to add to the timing buffer via the effect of soil organic matter mineralization. In still other cases where growers were successful in planting corn early, sidedressed N application could have taken place before the last period of heavy rain.



Photos 1 - 6 are illustrative of the impact of denitrification loss of N on corn in southern New Jersey (June 2013, Photos by R. Taylor).

The unusual weather pattern of 2013 (cold, followed by cold and wet, followed by dry and hot, and then this last period of moderate temperatures and heavy rainfall) led to slow mineralization of soil organic matter but complete denitrification of any soil N that had been mineralized and nitrified. In addition, in those fields that had been sidedressed with UAN early, a substantial portion of the urea and ammonium that had been nitrified to nitrate-N could have been lost to denitrification. The difficulty now will be getting on these wet fields with either sidedress N or additional N before the lack of N lowers the corn's yield potential.

At this point in the growing season, we all probably wish for a crystal ball to tell us how much N remains in the soil, what the weather will be like for the rest of the growing season, how best to get N on our crops, and a host of other questions. Unfortunately, that type of crystal ball just doesn't exist and the answers will likely vary from field to field. Each grower or consultant will need to evaluate the individual fields and try to make the best guess possible as to what needs to be done to produce the maximum economic return from each field. As a guide, you should keep in mind that N is a mobile element. What this means is that the plant will cannibalize the N from the older, lower leaves first and send that to either the growing point or later, after silking and pollination, to the grain that is being filled. The severity of N deficiency can to some degree be estimate by how many corn leaves on a plant are showing N deficiency symptoms. The more leaves affected the greater the severity.

Another question often asked is how much of the required N is taken up by the crop by a particular growth stage. An Iowa State Extension Special Report No. 48, "How a Corn Plant Develops", by Ritchie, Hanway, and Benson indicates that by tassel emergence to silking about 60 to 70% of the uptake of N has occurred with two thirds of the 60% taking place between V10/V12 and tassel emergence (R1). For potassium (K), about 90% of K uptake is completed by R1 with almost all of that occurring between V6 and R1. Phosphorus, on the other hand, has a steady and almost linear

uptake that is not complete until after R5 (dent stage).

Again from a nutrient management viewpoint, you need to consult with you nutrient management plan writer to be sure your plan is modified for this year's unusual weather. In addition to the proposed changes in your N management plan, be sure your plan writer includes the justification for the additional N you may need to apply to corn this year.

Announcements

Water Management Workshop

Tuesday, June 25 6:00-8:00 p.m.
Student Outreach Research Center
884 Smyrna Leipsic Rd Smyrna, DE 19977

Cost: Free

At this workshop, you will gain knowledge on reading water samples, how to amend your farm water, and learn of anything harmful to your livestock or plants that may be resting in your wells. **1.75 Nutrient Management Credits** will be offered at this event.

Register with Megan Pleasanton: (302) 857-6438 or mpleasanton@desu.edu

Soil Management Workshop

Wednesday, June 26 6:00-8:00 p.m.
Student Outreach Research Center
884 Smyrna Leipsic Rd Smyrna, DE 19977

Cost: Free

At this workshop, you will get the chance to lean about soil management. This includes how to take and read a soil sample, soil identification, soil texture, soil health and fertility, how to amend your soil and much more! **1.75 nutrient management credits** will be offered at this event.

Register with Megan Pleasanton: (302) 857-6438 or mpleasanton@desu.edu

**2013 University of Delaware Cooperative
Extension Horticulture Short Course:
Pest and Beneficial Insect Walks**

June 26, 2013 4:00-6:00p.m.
UD Carvel Research & Education Center
Sussex County Extension Office
16483 County Seat Hwy.,
Georgetown, DE
Cost: \$15

Tour the grounds of the Sussex County Extension Office in Georgetown to identify insects, diseases and beneficial insects in the landscape.

Instructors: Nancy Gregory, Brian Kunkel, Carrie Murphy, and Tracy Wootten

Register with Tracy Wootten: (302) 856-7303 or wootten@udel.edu

**2013 University of Delaware Weed Science
Field Day**

Wednesday, June 26, 2013
University of Delaware
Research and Education Center
(old office building)
16686 County Seat Highway
Georgetown, DE 19947

Registration begins at 8:15 at the Grove near the farm buildings.

A variety of herbicide programs for conventional tillage and no-till production are being evaluated. Many of the registered corn and soybean herbicides will be shown on the tour. The strengths and weaknesses of various approaches to weed management will be discussed. In addition, we have a number of trials integrating cover crops with chemical weed control. Herbicide evaluations for sorghum, watermelon, sweet corn and other vegetables are underway but these will not be part of the tour.

Lunch will follow the tour.

Recertification credit for pesticide applicators and Certified Crop Advisor are also available

There is no charge for this event. To register, please call Karen Adams at 302-856-7303 ext. 540 or

adams@udel.edu. For more information, contact Dr. Mark VanGessel at 302-856-7303 or mjv@udel.edu.

On Target Application Academy

Wednesday, June 26 3:00-5:00 p.m.
University of Delaware
Research and Education Center
(old office building)
16686 County Seat Highway
Georgetown, DE 19947

Looking for more information on spray nozzle technology?

Are your nozzles the best match for your herbicides?
Are you doing all you can to keep the spray on the intended site?

This program was developed and will be delivered by Dr. Bob Wolf for growers who self-apply herbicides and custom applicators. The On Target Application Academy is a one-of-a-kind educational opportunity to provide growers extensive hands-on training for better awareness of herbicide application practices to achieve the most effective weed control possible with today's emerging product and equipment innovations, and help mitigate spray drift – which is a continuous area of focus for the agricultural industry. Dr. Wolf recently retired as Professor Emeritus from Kansas State University where he worked as a Professor and Extension Specialist in Application Technology in the Biological and Agricultural Engineering Department. Wolf's main responsibility at Kansas State was to conduct an extension and research program in all areas of chemical/pesticide application with a particular emphasis on nozzle technology.

This workshop is sponsored by BASF. There is no registration fee.

Recertification credit for pesticide applicators and Certified Crop Advisor are also available.

More information can be found at: <http://www.agro.basf.us/stewardship/on-target-stewardship.html> or contact Mark VanGessel (302) 856-7303.

2013 Wye Weed Science Field Day

Thursday, June 27, 2013

Wye Research and Education Center
Queenstown, MD

There will be a morning tour at the Wye Research and Education Center. CCA CEUs will be offered along with MD Pesticide credits.

For more information, contact Dr. Ron Ritter at 301-405-1329 or by email rlritter@umd.edu.

Delaware Soybean Board Tour

Thursday, August 22, 2013

Tour sponsored by the Delaware Soybean Board

More details in the next Weekly Crop Update.

Respect the Rotation

Thursday, August 22 4:00-6:00 p.m.

UD Research and Education Center
Georgetown, DE

Respect the Rotation is an initiative to elevate the importance and adoption of herbicide diversity and integrated weed management.

Rotate Modes of Action

Reduce the selection pressure of a single mode of action by using multiple modes of action during both the growing season and from year to year.

Rotate Crops

Crop rotation diversifies weed management tools.

Rotate Herbicide-Tolerant Traits

Alternate herbicide-tolerant (HT) traits and/or use HT trait stacks for more efficient herbicide rotation.

Overreliance on a single weed-control method causes resistant weeds to develop and puts the herbicide-tolerant system used and the ability to grow a crop in a specific field in jeopardy. When resistant weeds develop, farmers face the additional costs required to control them—unplanned herbicide applications, intense manual labor, and in extreme cases, total crop loss. Integrated Weed Management practices help to preempt these issues and result in successful management of resistant weed populations. Field plots

and demonstrations on rotations for integrated weed management will be discussed.

Supported by Bayer CropScience and in collaboration with Delaware Soybean Board.

For more information contact Mark VanGessel (302) 856-7303

Organic and Sustainable Agriculture Field Tour

Wednesday, September 4, 2013

Hold this date for a late afternoon or evening field day highlighting research and demonstration projects for organic and sustainable agricultural production. More details to follow.

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of June 13 to June 19, 2013

Readings Taken from Midnight to Midnight

Rainfall:

0.24 inch: June 13

0.06 inch: June 14

0.03 inch: June 16

0.01 inch: June 17

1.65 inch: June 18

Air Temperature:

Highs ranged from 90°F on June 13 to 73°F on June 14.

Lows ranged from 70°F on June 17 to 57°F on June 14 and June 15.

Soil Temperature:

75.5°F average

Additional Delaware weather data is available at
http://www.deos.udel.edu/monthly_retrieval.html
and
<http://www.rec.udel.edu/TopLevel/Weather.htm>

*Weekly Crop Update is compiled and edited by
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Crops*

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